

Delirium and Deep Sedation in a Long-Term Acute Care Hospital

Lauren Crozier, BSN Candidate

Mentor: Michele Balas, PhD, RN, CCRN-K, FCCM

College of Nursing

The Ohio State University

Abstract

Research conducted in the intensive care unit (ICU) suggests the development of delirium, agitation, and deep-sedation effects numerous patient outcomes. There is little information, however, about the frequency of these syndromes/symptoms in the Long Term Acute Care Hospital (LTACH) setting (i.e., centers that specialize in mechanical ventilation weaning and rehabilitation). This interim analysis will describe the prevalence, incidence, and duration of delirium, coma, deep sedation, and agitation in adults who require mechanical ventilation in the LTACH setting and explore the accuracy of Registered Nurses' (RNs) assessment of delirium. The ongoing study utilizes a prospective, observational, before/after design. The first five patients enrolled at a single-center LTACH were included. A trained research assistant performed daily, in-person delirium and level of arousal assessments using valid and reliable tools (i.e., the Confusion Assessment Method -ICU [CAM-ICU] and Richmond Agitation Sedation Scale [RASS] respectively) for up to 28 days, discharge, and/or death. Medical charts were used to record RNs' delirium assessments. In-person assessments were performed on 62/100 (62%) total LTACH days. From the total days assessed (n=62), 39 days (63%) were spent at goal RASS (i.e., -1 to +1), 22 (35%) deeply sedated (i.e., -2, -3), 1 (2%) in coma (i.e., -4 or -5), and no days agitated (i.e., +2 to +4). Excluding the 1 coma day, delirium occurred on 28/61 (46%) of all days assessed. RNs frequently misinterpreted CAM-ICU results, with 55/100 (55%) episodes of CAM-ICU recorded as "Unable to Assess" in patients who had applicable RASS scores. Episodes of deep sedation and delirium are common in the LTACH setting, occurring in over 1/3 and nearly 1/2 of all days assessed respectively. Over half of RN CAM-ICU assessments were deemed inaccurate, creating an opportunity to improve LTACH RNs' delirium assessment skills.

Delirium and Deep Sedation in a Long-Term Acute Care Hospital

The “chronically critically ill” (CCI) population (i.e., patients recovering from an extended intensive care unit (ICU) stay, prolonged mechanical ventilation (PMV), and/or tracheostomy placement) will near 600,000 within the next decade and consume over \$60 billion dollars in hospital costs (Cox, 2012; Zilberberg, 2008). Persons who develop chronic critical illness, particularly those receiving prolonged mechanical ventilation (PMV), experience very high one-year mortality rates (44-77%) (Cox, 2009; Carson, 1999) and incur multiple transitions in care (Unroe et al., 2010). In addition to increased mortality rates, most CCI patients will undergo major physical, cognitive, and emotional impairments that follow them throughout the rest of their life (Cox, 2009; Carson, 1999; Nelson, 2006; Unroe, 2010; Kahn, 2013; Dermot, 2014). While an increasing number of CCI patients are admitted to Long Term Acute Care Hospitals (LTACHs) (Ehlenbach, 2014), little is known about this groups’ unique care needs and symptom experience. The research described will address this important knowledge gap.

Background

According to the *Society of Critical Care Medicine* (SCCM) (2016), improvements in healthcare delivery have contributed to an increasing number of patients who are now able to survive a serious or life-threatening illness. Unfortunately, for many ICU survivors, the post-ICU period is exceptionally difficult and many are left with serious physical, cognitive, and psychological impairments. These findings have led to a rather dramatic paradigm shift in critical care, with providers now focusing on important patient and family-centered outcomes rather than mortality alone (SCCM, 2016). This paradigm shift is especially important for the CCI population. The CCI are in general very sick patients who survive an initial ICU stay and are frequently dis-

charged to facilities such as LTACHs for rehabilitation and mechanical ventilation weaning purposes. Most CCI patients experienced a number of distressful symptoms/syndromes during their initial ICU stay including pain, agitation, over-sedation, delirium, and weakness (Balas, 2014). These symptoms are believed to frequently persist post-ICU stay.

CCI patients tends to be older, have multiple co-morbidities, and suffer from at least one distressful symptom (90%) (e.g. pain, dyspnea, weakness) during the course of their recovery (Wienczek, 2010; Carson, 2012). They also frequently experience severe and enduring brain dysfunction (i.e. coma and/or delirium), functional impairment, and a relatively poor quality of life (Coz, 2009; Carson, 1999; Nelson, 2006; Unroe, 2010; Kahn, 2013; Dermot, 2014). These symptoms/syndromes during and post ICU-hospitalization are often portrayed as seemingly unfortunate and inevitable; however, recent evidence suggests that the inappropriate assessment, prevention, and management of these symptoms may actually be causal to the poor outcomes experienced by the CCI population (Barr, 2013).

The ability to accurately identify distressing symptoms is one of the most important assessment skills in nursing because it provides the proper starting point for interventions aimed at alleviating discomfort. In the CCI population, effective nurse-patient communication is challenging due to mechanical ventilation, tubes that impede normal speech, over sedation, and delirium (Nelson et al., 2004). Although these patients often undergo specialty rehabilitation services and survive an acute episode, they frequently progress to a chronic state of multi-organ complications (Campbell & Happ, 2010). To understand CCI symptoms and perceiving them will ultimately help better care and potentially improve quality of life of this fragile population.

While most CCI patients wish to return home, those who require PMV experience multiple transitions in care (median 4) during the year following discharge (Unroe, 2010). These transitions ultimately lead to further costs and persistent impairments from individual baseline (Unroe, 2010). Despite the multi-dimensional life-altering changes after ICU stay, increased costs and diminished quality of life, there is very limited scientific evidence available to help clinicians care for the chronically critically ill population.

Purpose of the Study

The interim analysis, described herein, comes from a parent study entitled *“Helping Older People Emerge Stronger” (HOPES) after Critical Illness* (Balas, 2016). The HOPES study utilizes a mixed-methods design with quantitative and qualitative components exploring staff and patient outcomes associated with a newly developed symptom management intervention for the chronically critically ill. Specifically, the HOPES study prospectively explores the process and effects of implementing the ABCDEF bundle into the everyday care of patients requiring prolonged mechanical ventilation in the LTACH setting. The ABCDEF bundle is a set of evidence based interventions that include the following components: **A**ssess, prevent, and manage pain, **B**oth spontaneous Awakening Trials (SATs) and Spontaneous Breathing Trials (SBTs), **C**hoice of analgesia and sedation, **D**elirium assess, prevent, and manage, **E**arly mobility and exercise, and **F**amily engagement and empowerment (Balas, 2015). The *Society of Critical Care Medicine’s Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium* and a number of patient safety and quality organizations, including the Institute for Healthcare Improvement and the Gordon and Betty Moore Foundation, have recently endorsed the ABCDEF Bundle protocol to be implemented in all traditional ICUs. While not formally tested in the setting of chron-

ic critical illness, *Select Specialty Hospital*, a national network of more than 100 LTACHs across the United States, has expressed the desire to adopt the ABCDEF bundle as a “standard of care” in their practice.

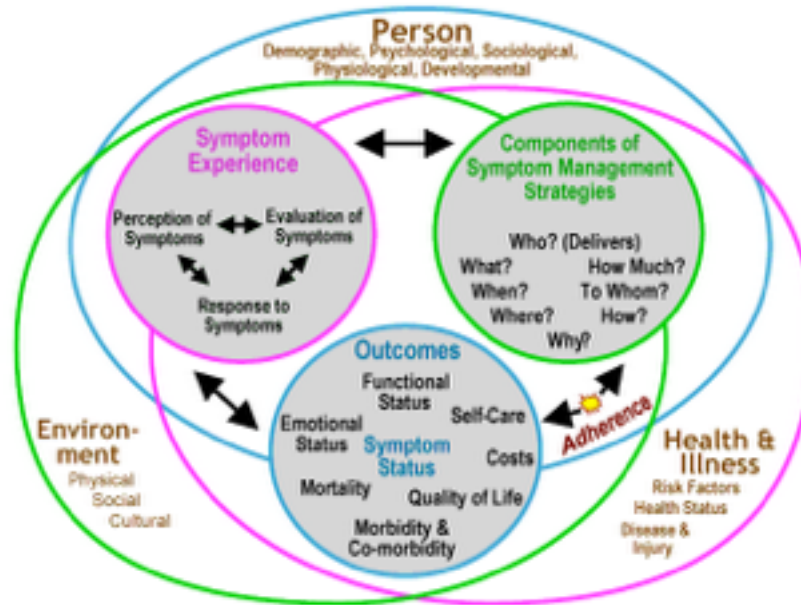
The parent study aims to: 1) identify facilitators and barriers to successful ABCDEF bundle implementation in the LTACH setting, 2) compare the symptom experience of patients receiving usual LTACH care to those treated with the ABCDEF bundle, and 3) evaluate the impact ABCDEF bundle implementation has on safety and patient-centered outcomes (i.e., delirium/coma free days, weaning duration, tracheostomy removal, mortality, weakness, functional and cognitive ability and discharge disposition) of patients receiving usual LTACH care to those treated with the ABCDEF bundle. The aims of this interim analysis are described below.

Significance of the Study

This study directly addresses the lack of scientific research involving CCI patients admitted to LTACHs who require PMV weaning and rehabilitation. It represents one of the first attempts to develop evidence aimed at improving the symptom experience and outcomes of the chronically critically ill. It is unclear whether implementing the ABCDEF Bundle late in the course of serious illness will reduce the burden of symptomatology of adult ICU survivors and improve clinical outcomes; however, *Select Specialty Hospital* is showing strong interest in adopting this evidence-based intervention into the everyday care of patients admitted after an ICU stay. The innovation of the study is that it will be the first to explore whether the ABCDEF bundle will be helpful for future ICU survivors who are discharged to a LTACH.

Conceptual Frame of Reference (Theory)

Figure 1. The Symptom Management Theory



This study is guided by the Symptom Management Theory (SMT) [Figure 1]. The aims of this theory are to improve patients' quality of care by decreasing symptom morbidity, therefore improving quality of life, with emphasis on the individuals' ethnic and cultural groups. There are three domains of the SMT including; person, health and illness, and environmental. Symptom experience and perceptions are also analyzed if the ability to modify or influence experience based on thoughts, mechanical ventilation and sleep. Limitations of SMT are perception of pain and family involvement. SMT pertains to anyone with a symptom that may need to be managed, and it helps to identify the barriers and factors influencing effective symptom management. The scope of this theory is to delay negative outcomes through biomedical, professional and self-care strategies.

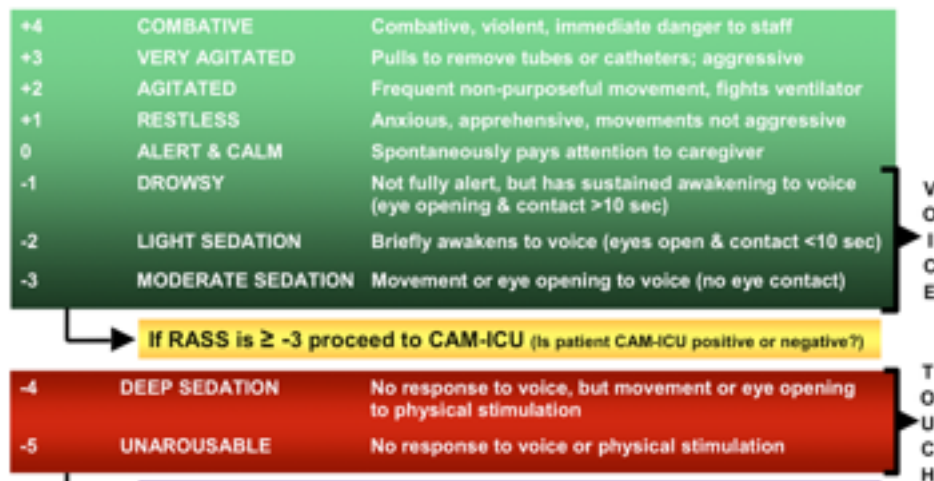
Aims/Research Questions

The aims of this interim analysis, which includes data from the first five patients enrolled in the HOPES study, are to: 1) describe the prevalence, incidence, and duration of delirium, coma, deep sedation, and agitation in adults who require mechanical ventilation admitted directly from an ICU to a LTACH and 2.) explore the accuracy of Registered Nurse (RN) assessment of delirium.

Definition of Methods and Terms

Delirium is defined as an acute change in mental status, or a fluctuation of mood, associated with impaired attention, disorganized thinking, confusion and an altered level of consciousness (APA, 1994). The Richmond Agitation and Sedation Scale (RASS) (Ely, 2003) is used to assess the level of consciousness and arousal [Figure 2].

Figure 2. The Richmond Agitation and Sedation Scale



Goal RASS: scored as 0, patient is alert and calm and spontaneously pays attention to caregiver.

Coma: RASS score of as ≥ 4 . Unarousable and no response to voice or physical stimulation.

Deep Sedation: RASS score of -2 and -3. Briefly awakens to voice, either sustained or without eyes opening.

Agitation: RASS score of $\geq +2$. From non-purposeful movement and aggressive line pulling to combative and immediate danger to staff.

Review of Literature

There is little information that exists regarding the incidence and outcomes of the syndromes and symptoms that patients experience in the LTACH setting. This is unfortunate considering each year 130,000 patients are admitted to LTACHs for mechanical ventilation and rehabilitation (Kahn, 2013; MedPAC, 2014). This interim analysis focuses on delirium, or a disturbance of consciousness and inattention marked by a change in cognition or perceptual disturbance that develops over a short period of time (hours to days) and fluctuates over time (DSM-IV, 2017). The impact of delirium accounts for up to 80% of mechanically ventilated patients in the ICU and its association to many negative health outcomes such as increased length of hospital stays and costs, poorer prognosis (marked by increased mortality rates), and diminished quality of life (Brummel & Girard, 2013). By understanding the occurrence of delirium in mechanically ventilated ICU patients, it provides insight to the prevalence, incidence, and duration of delirium in the continuum of care as the patient transitions to an LTACH setting.

According to the 2013 clinical practice guidelines for Pain, Agitation, and Delirium (PAD), it is recommended that all adult ICU patients should be regularly (i.e. once per shift) assessed for delirium using either the Confusion Agitation Method for the ICU (CAM-ICU) or The Intensive Care Delirium Screening Checklist (IDCSC) (Barr et al., 2013). Delirium can manifest in one of three ways: hypoactive (sedated), hyperactive (agitated), and mixed delirium (Ameri-

can Psychiatric Association, 1994). Hypoactive delirium is important to note because it occurs more frequently in the ICU setting and attributes to a greater need for MV, increased length of stay, and higher mortality rates than the incidence of hyperactive compared to hyperactive and mixed delirium (Peterson, 2006; Scotto, 2009; Panharipande, 2007). Pathophysiological mechanisms involved in the development and progression of delirium remain unsubstantiated.

Anatomic deficits and neurotransmitter imbalance are two mechanisms thought to be related to both development and progression of delirium. Anatomical areas involved are higher cortical areas of the brain, such as the prefrontal and non-dominant posterior parietal regions according Trzepacz (2000). Other areas in the same review indicates the anterior thalamus, basal ganglia, and the temporal occipital cortex, implicated by CT/MRI or SPECT scans in delirium (Trzepacz, 2000).

An alternate explanation for the development of delirium involves imbalances in neurotransmitters. Specifically, imbalances of serotonin, acetylcholine (deficiency) and (excess) dopamine are suspected in the development of delirium (reference). Other factors suspected in the development of delirium include cerebral metabolism, primary intracranial disease, systemic diseases, secondary infections of the brain, exogenous toxic agents, hypoxemia, withdrawal from substances of alcohol or sedative-hypnotic agents, metabolic disturbances and administration of psychoactive medication (i.e. benzodiazepines and narcotics) (Pandharipande et al., 2006).

Pandharipande and colleagues (2006) also noted that three important risk factors for transitioning to delirium were patient age, severity of illness, and sedative medication (specifically lorazepam). Although the controversies about the underlying mechanisms for the development of

delirium remain unresolved , outcomes of delirium are significant and an area of important clinical research.

In the ICU setting, the prevalence of delirium is over three-quarters (20-80%) in patients receiving mechanical ventilation and up to one-half (50%) of those not receiving mechanical ventilation (Brummel, 2013; Ely, 2001; Dubois, 2001; Girard, 2008; Pandharipande, 2008; Guenther, 2010; Bergeron, 2001). In older adults aged 65 years and older, delirium incidence increases (up to 30%) (Arumugan et al, 2017) and adds approximately 10 days to the patients' mean length of stay (Ely, 2004). Through multiple studies, delirium has been associated with mortality rates, length of hospital stays, increased costs, development of dementia, and benzodiazepine administration (Arumugan et al, 2017; Brummel, 2013; Ely, 2001; Pandharipande, 2008).

In a cohort of mechanically ventilated patients with similar baseline characteristics (n=275), delirium was an independent predictor of higher 6-month mortality and longer stays (Ely, 2004). This remained unchanged with adjustments to relevant variables including coma and sedative/analgesics medications. In another study, the majority of the patients developed delirium in the ICU and delirium was determined as the strongest determinant of length of stay in the hospital (Ely, 2001). Milbrandt (2004) also found severity and duration of delirium were independently associated with incrementally greater costs (all $p < 0.001$), and delirium was associated with 39% higher ICU costs. Benzodiazepine (i.e. lorazepam) administration was found to be an independent risk factor for daily delirium transitions in care (odds ratio, 1.2 [95% confidence interval, 1.1-1.4]; $P=0.003$); whereas fentanyl, morphine, and propofol were associated with higher, but not statistically significant odds ratio (Milbrandt, 2004). Lastly, delirium was a fre-

quent complication in a 185 cohort in ICU patients aged 65 years or older, persisting beyond the ICU stay, and identified as a risk factor of for the development of dementia (McNicoll et al., 2003). Persistence of delirium beyond the ICU justifies this study of delirium incidence, prevalence and duration in an LTACH setting.

The importance of studying delirium and other symptoms that occur within CCI is the implication they have for the recovery and rehabilitation from critical illness. Syndromes/symptoms that are inappropriately treated may contribute to poor outcomes frequently associated with individuals who require PMV (Balas, 2016). Management of delirium is crucial to the outcomes of this patient population as they transition from an acute care setting to a setting focused on rehabilitation and liberation from mechanical ventilation in an LTACH..

One additional area to be explored is the accuracy of clinician and RN's assessment skills of delirium in the LTACH setting. The valid and reliable tool used to assess delirium is the CAM-ICU (Ely EW, 2001); however, delirium detection is only possible through correct use of this tool. Within the LTACH setting, nurses and clinicians may be unaware of their misuse in the instrument. Reform of this tool may be needed due to the speciality area. In fact, Kwapis (2009) describes the need for a delirium protocol in post-acute care setting for patients on admission and during their course of stay. Use of a protocol would document delirium and provide a basis for mitigating associated complications.

The importance of improvement of care and detection of delirium among the CCI population who receive PMV is crucial due to the ever-growing number in the next decade. Understanding the incidence of delirium in the ICU setting and the implications to care of patients involved can help clinicians make more appropriate decisions for care, as these patients transition

to an LTACH setting. While no studies to date have tested delirium prevention interventions, studies that describe the incidence of delirium and other symptoms in CCI patients provide a basis for intervention development in this setting.

Research Design

The HOPES study is an ongoing prospective, observational, before/after study regarding the delirium and deep sedation which supports this study. Data collection included in-person interviews of the patient and surrogate on admission and at time of discharge. From the time of enrollment, daily in-person symptoms/syndromes assessments were conducted using valid and reliable delirium (CAM-ICU) and level of arousal (RASS) screening tools until time of discharge or up to 28 days. Medical record reviews were also used to determine a mismatch of delirium assessment due to the inability to obtain from the nurses' documentation.

Population and Sample Design

The sample included in this analysis was the first five patients enrolled in the HOPES study. The primary study was conducted at *Regency Hospital Columbus, Inc.*, a 152 bed, free-standing LTACH in Columbus, Ohio. This LTACH provides comprehensive, inter-professional, specialized care for patients with a variety of diagnoses, with a primary focus on mechanical ventilation weaning and rehabilitation. It is estimated that this LTACH admits 15 patients a month (135 in a 9-month period) for mechanical ventilation discontinuation, the majority being discharged from ICUs. A trained research assistant identified potential participants discharged from an ICU from daily admissions to the high observation unit provided by the charge nurse. Participants were approached on days that staff were available and family members were present.

The inclusion criteria for the primary study included: Adult aged 18 years and older, admitted to LTACH directly from an intensive care unit, and English speaking. The exclusion criteria included: Severe neurologic deficits defined as a coma (i.e. Richmond Agitation Sedation Score (RASS) score (Ely, 2003) and ≥ -4 due to stroke, intracranial hemorrhage, cranial trauma, malignancy, anoxic brain injury, or cerebral edema), inability to obtain informed consent from the patient's legally authorized representative (LAR) within 96 hours of meeting all inclusion criteria, chronic ventilator dependence that is deemed "not wean-able" (unable to be weaned from mechanical ventilation) by admitting LTACH physician, and/or inability to obtain consent (patient and/or LAR refusal). If the enrollment criteria were met, the LAR must have sufficient contact with patient (minimum of 4 hours phone/in-person conversations per week) for the last 10 years.

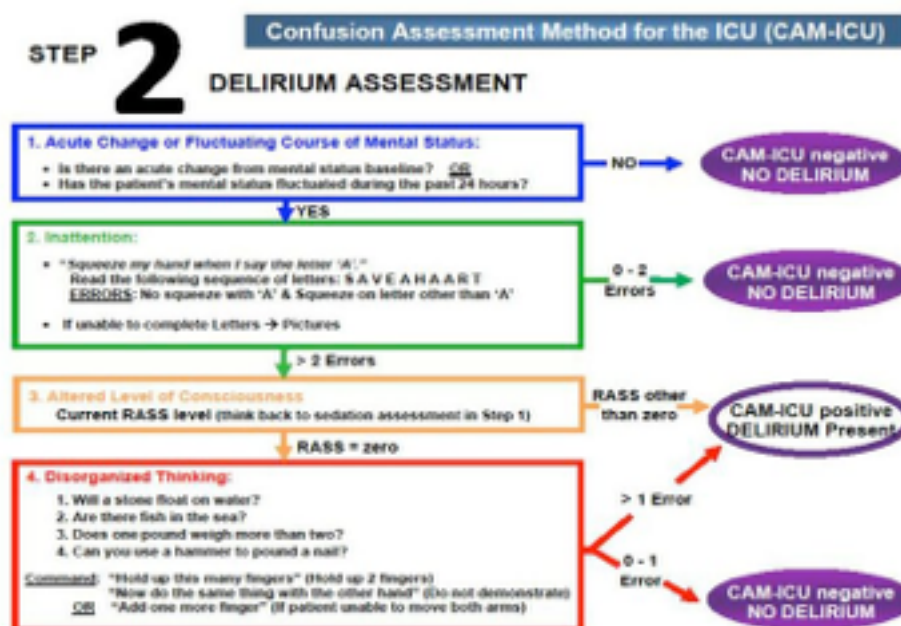
Data Collection Procedure

In efforts to ensure reliability of assessments, a research assistant was trained by members of the research team (i.e. Dr. Michele Balas). The research assistant was responsible for enrolling patients, performing daily symptom assessments and admission and discharge interviews, conduct standardized medical record reviews, and monitor ABCDEF bundle adherence. At time of study enrollment, the measures obtained during the primary study included: demographic data, admission source, original intubation and tracheostomy placement data and primary admitting diagnosis.

Daily measures were conducted on the enrolled patients during their entire LTACH hospitalization, or up to 28 total LTACH days. For the purpose of this interim analysis, the trained research assistant measured each patient's arousal level with the Richmond Agitation-Sedation

Scale (RASS) (Ely, 2003) at time of each in-person interview. For participants who receive a RASS score of -3 or higher, an in-person delirium assessment was conducted by the trained research assistant, using the CAM-ICU (Ely et al, 2001; Ely EW et al, 2001; Puntillo, 2010). If a patient is deemed greater than or equal to -3 the assessment may proceed to the Confusion Agitation Method (CAM-ICU) (Ely, 2001) [Figure 3].

Figure 3. Confusion Assessment Method for the ICU (CAM-ICU)



The CAM-ICU is a valid and reliable tool to assess delirium using a four method algorithm of acute mental status change, inattention, altered mental status change (RASS other than zero), and disorganized thinking. The accuracy of the CAM-ICU assessment by the Registered Nurse (RN) was recorded from the patient's chart. The accuracy was measured by number of documented CAM-ICU positive (i.e. delirium) episodes, number of CAM assessments rates as

unable to assess (UTA), and number of CAM assessments rated as unable to assess (UTA) done incorrectly.

The administration of the CAM-ICU at time of in-person interview allowed us to calculate the incidence and duration of delirium in a LTACH setting. The daily collection of RASS scores at time of in-person interview helped determine the accuracy of the RN delirium assessments, as said above, if the patient has a score at -3 or higher, the CAM-ICU assessment should be performed and completed. Cases of unable to assess (UTA) should only occur in those patients with a documented RASS score of -4 or -5.

Results

The first five subjects enrolled in the primary study were included in this interim analysis. Table 1 shows demographic characteristics of the total sample size (n=5). The sample included 4 men and 1 woman, aged 28 to 79 years. Each subject received MV prior to their LTACH admission. The days spent on MV prior to LTACH admission ranged from 11 to 34 days; median 14.

Table 1. Sample Demographics

Study ID #	Age	Sex	Race	Days of MV prior to LTACH
1	63	Male	Caucasian	28 days
2	79	Female	Caucasian	14 days
3	66	Male	Caucasian	34 days
4	28	Male	Caucasian	11 days
5	69	Male	Caucasian	13 days

We were able to collect 62 out of 100 total assessment days ($n=62$) from the five subjects. The missing data collection days were from the patient not being on the floor, refusal, and staff availability. “Goal” RASS (defined -1 to +1), agitated ($\geq +2$ RASS), deeply sedated (-2 and -3), and coma (≥ -4) were assessed by the research assistant at time of in-person interview. If the patient had an applicable RASS score, a CAM-ICU assessment would be completed. Of the in-person assessments ($n=62$), over 1/3, or 22 days, of RASS scores were spent in deep sedation (35%) with the longest consecutive days of deep sedation being 4 days. Goal RASS was achieved for approximately 39 days (63%) of the time, with 1 incidence of coma, and no days spent agitated. These applicable RASS scores were able to proceed onto delirium assessment using CAM-ICU, excluding one coma day. Excluding the 1 coma day, delirium occurred on 28/61 (46%) of all days assessed.

The next information obtained involved the RNs’ assessment of delirium using the CAM-ICU tool. From the medical chart review, if the RN documented at least one incidence of “unable to assess” or UTA in regards to the CAM-ICU assessment, we considered the entire day as a “UTA” day. Of the total 100 days ($n=100$) cumulative from the 5 enrolled subjects, the RNs’ deemed at least 1 CAM-ICU assessment as “UTA” each of the 100 days ($n=100$).

When the documentation in the medical record review was compared to those 100 in-person interview assessments, over 1/2 (55%) of patients were scored with applicable RASS scores. When compared to the $n=62$ days, 1/2 of the CAM-ICU assessments were calculated as positive for delirium, with 1 coma day resulting in an inapplicable RASS score. The implications of

these findings suggests the lack of assessment skills regarding CAM-ICU to these RNs' in the LTACH setting.

Conclusions and Recommendation

In conclusion, this interim analysis describes the incidence of delirium, coma, deep-sedation, and agitation of patients who are deemed CCI and on PMV. Deep sedation is the most prevalent among this small cohort, with one-third of patients experiencing it for as long as four consecutive days. From the applicable RASS scores, CAM-ICU was assessed and delirium was present in patients who are admitted to a LTACH post-ICU hospitalization, with over one-half days assessed positive for delirium. RNs' have also shown room for improvement of their CAM-ICU assessment for detection of delirium with inappropriate labeling as "UTA" when applicable RASS scores were present. Although these findings were not tested for statistically significance due to the small sample size, additional study of delirium, deep sedation, coma and agitation in a LTACH setting might be a new focus.

Delirium and deep sedation have many negative implications such as increased hospital length of stay, increased costs, decreased quality of life, and ultimately higher mortality rates. Understanding delirium and level of consciousness and its significance to the outcomes of patients who receive MV is vital as this fragile population continues their journey to rehabilitation and MV weaning at an LTACH. Deep sedation is in fact present within the LTACH setting. This is new information that can serve as a basis for improved methods to detect, prevent and manage delirium in the LTACH setting. Use of a protocol such as the ABCDEF bundle may provide an important intervention to decrease delirium in this setting.

Assessment skills are necessary to detect delirium. Within the 100 day timeframe, no days were correctly assessed using CAM-ICU. These results highlight the need for additional education for RN's in the LTACH. These findings are not inconsistent with findings from the ICU setting (Swan, 2014; Corradi, et al., 2016)). Because few studies are conducted in this setting that document delirium and other symptoms, bedside nurses may not be convinced of making delirium detection a priority. Use of the CAM-ICU or other valid and reliable instrument is crucial in the ICU setting; however, use in the LTACHH setting may require modifications. Future studies could further define the prevalence, incidence, and duration of delirium, deep sedation, agitation, and coma in the LTACH setting. This interim analysis showed that delirium is present and should further be explored. Recommendations of CAM-ICU assessments skills of LTACH RNs' should also be investigated, with potential room for improvement and education opportunities. A qualitative design may be appropriate to determine cause for inaccurate assessment skills of delirium using CAM-ICU.

Limitations

The small sample size of 5 patients limit this study to exploratory analysis, rather than to statistical significance. In addition, all data for the 5 patients were collected at a single site due to the original pilot study. This means that results cannot be generalized to the wider population of CCI patients. .

It may be valuable to measure patient's level of consciousness using the RASS at multiple times a day at set times, in order to demonstrate possible fluctuations of consciousness and delirium. According to the RNs' documentation, nurses performed the CAM-ICU approximately 1 to 2 times a day. This may have led to inaccurate assessments and affected care. .

Implications of Study

Reporting the incidence, prevalence, and duration of delirium in patients at an LTACH setting will positively impact clinicians and their ability to care for this patient population of the chronically critically ill. With help from *Balas' ABCDEF Bundle* protocol, delirium may be a better assessed, prevented, and managed symptom. The data reported also creates an opportunity for further improvement of delirium assessment skills.

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